

APPENDIX A

Symposia Abstracts

Peptides in locusts: a review

Liliane Schoofs, Dirk Veelaert and Arnold De Loof

Zoological Institute, K.U.Leuven, Naamsestraat 59, 3000 Leuven, Belgium

The first peptide identified in locusts was adipokinetic hormone I (AKH I), a neurohormone mobilizing lipids from the fat body. No other insect peptides were isolated until 1986. From then on peptide identification started to boom at such a tremendous fast rate that even specialists in the field could hardly keep track. At this moment the total number of different insect neuropeptide sequences exceeds 100. For the moment being, the locusts, *Locusta migratoria* and *Schistocerca gregaria* are the species from which the largest number of (neuro)peptides has been isolated and sequenced, namely 54.

Myotropic bioassays have played a major role in the isolation and subsequent structural characterization of locust neuropeptides. They have been responsible for the discovery of locustamyotropins (4), locustapyrokinins (2), locustatachykinins (5), locustakinin (1), locusta accessory gland myotropins (2), locustasulfakinin (1), locustacardioactive peptide (1) and locustamyoinhibiting peptides (3). Members of the myotropin peptide families have been associated with a variety of physiological activities such as myotropic activities, pheromonotropic activities, diapause induction, stimulation of cuticular melanisation, diuresis and allatostatic activities. Some of the members appear to be important neurotransmitters present in nerves innervating the locust oviduct, the salivary glands, the male accessory glands and the heart, whereas other are stored into neurohaemal organs until release into the haemolymph. Some myotropic peptides have been found to be releasing factors of neurohormones from the corpora cardiaca. Several peptides isolated in locusts appear to be unique to insects or arthropods, others seem to be members of peptides families spanning across phyla: two vasopressin-like peptides, FMRFamide related peptides, Locusta diuretic hormone (CRF-like), Locusta insulin-related peptide, locustatachykinins, locustasulfakinin (gastrin/CCK-like).

In a systematic structural study of neuropeptides in *Locusta*, several novel peptides have been isolated from the corpora cardiaca and the pars intercerebralis. They include the neuroparsins, two 6 kDa dimeric peptides and three proteinase inhibitors. Ovary maturing parsin is the first gonadotropin identified in insects. The isolation of a peptide from an ovary extract that inhibits ovary maturation in *Schistocerca gregaria* is currently underway in our lab. The proteinase inhibitors, recently found to be mainly transcribed in the fat body are believed to play a role in defense reactions in insects. Recently we have identified in *Schistocerca gregaria* nine peptides belonging to the allatostatin peptide family, that inhibit peristaltic movements of the oviduct. Finally a locust ion transport peptide and a peptide stimulating salivation in *Schistocerca* can be added to this extensive list of locust peptides.